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GB 1279558  
GB 1241486  
US 3948557 A

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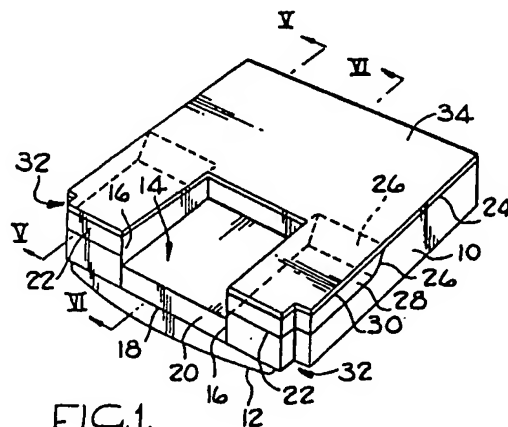
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(54) Wheel chair cushion

(57) A cushion the body of which is of foamed material and which has a recess (14) in one edge thereof. An insert (20) also of foamed material is in the recess. The insert is of less dense and softer material than the body. The lower face of the insert is secured to the body and its vertical faces, while close to the faces (16) of the recess, are not attached thereto. The parts of the body on each lateral side of the recess are, in one embodiment, of composite form and include elements (28) of a foamed material which is less dense and softer than the material of the main block (10) of the body but harder and more dense than the material of the insert. In a further embodiment, the body of the cushion consists of three layers, the recess being in the middle layer.



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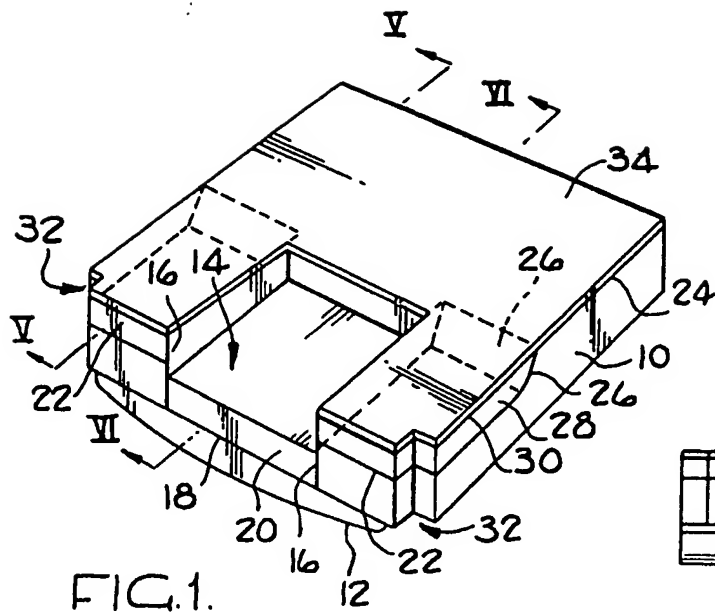


FIG. 1.

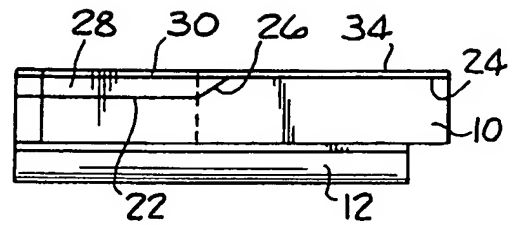


FIG. 2.

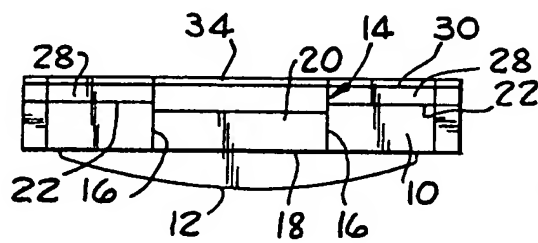


FIG. 3.

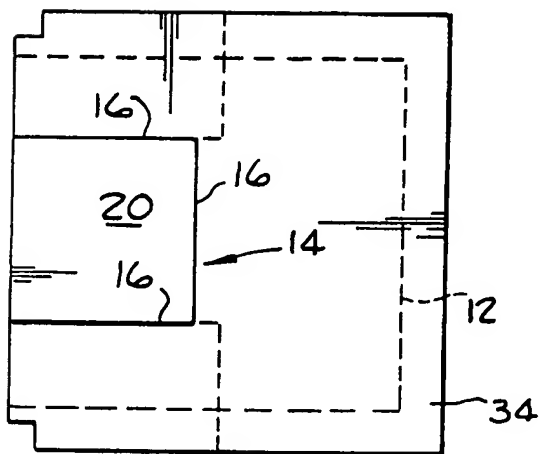


FIG. 4.

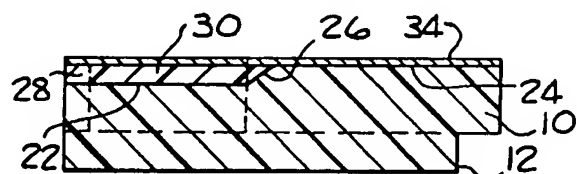


FIG. 5.

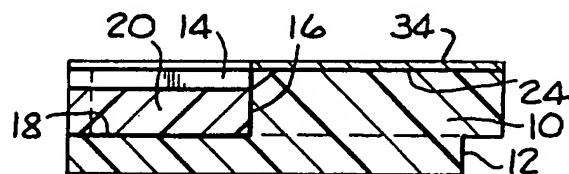


FIG. 6.

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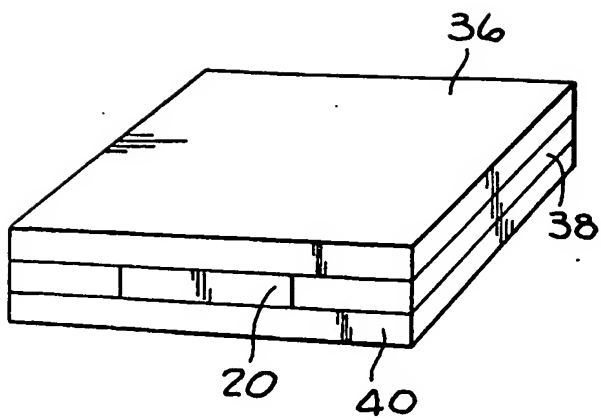


FIG. 7.

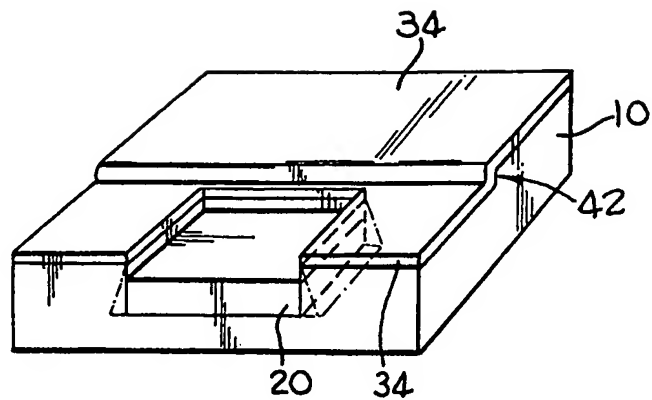


FIG. 9.

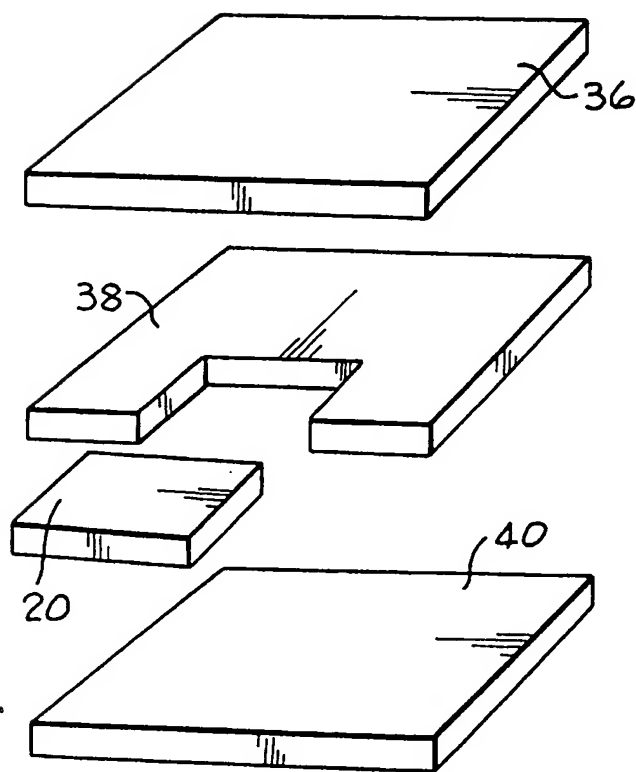


FIG. 8.

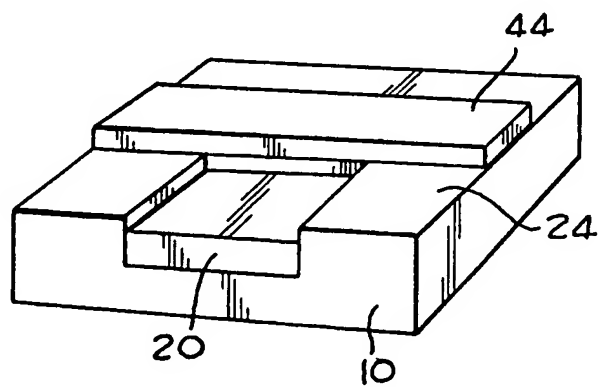


FIG. 10

## SPECIFICATION

## A cushion for supporting a sitting person

- 5 This invention relates to a cushion for supporting a sitting person.

According to the present invention there is provided a cushion which comprises a body of foamed synthetic plastics material, the body having a recess in one face thereof to reduce the thickness of the body, over the area of the recess, with respect to the remainder of the body, there being an insert of foamed material in said recess, the material of the insert being less dense and softer than the material of the body, the insert being arranged such that the ischial tuberosities of a person sitting on the cushion bear down on said insert thereby to reduce the portion of the mass of the patient which is supported on the ischial tuberosities.

20 To assist the cushion in conforming to the anatomical shape of the person sitting thereon, the body is preferably of composite form and comprises a main block and two elements, said elements overlying those portions of the main block which are on each lateral side of said recess, said elements being of foamed material which has a density less than the density of the material of the main block and greater than the density of the material of the insert.

The upper face of said remainder of the body, which can be flat, can be covered by a layer of foamed material which is softer than the material of the body. The same material can be used for the block and for the insert.

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:

Figure 1 is a pictorial view of an orthopaedic cushion,

40 Figure 2 is a side elevation of the cushion of Figure 1,

Figure 3 is a rear elevation of the cushion of Figure 1,

Figure 4 is a top plan view of the cushion,

45 Figures 5 and 6 are sections on the lines V-V and VI-VI of Figure 1,

Figure 7 is a pictorial view of a further form of cushion.

Figure 8 is an 'exploded' view of the cushion of Figure 7,

50 Figure 9 illustrates a modified form of the cushion of Figure 1, and

Figure 10 illustrates yet another form of cushion.

The orthopaedic cushion illustrated in Figures 1 to 56 is constructed from foamed synthetic plastics material of different densities and hardnesses and is intended for use with a wheel chair.

The cushion comprises a body including a block 10 having integral therewith a base 12 which has a curved underface. The base is thus shaped so as to fill the depression conventionally provided in the seat of a wheel-chair.

A recess 14 is cut in the rear edge of the block 10, this recess being bounded by vertical faces 16 of the block 10 and by a horizontal face 18 which is an

upper face of the base 12. An insert 20 of foamed plastics material is glued to the face 18 and has three of its vertical faces abutting the faces 16 of the insert 10. The vertical faces of the insert 20 are not secured to the faces 16.

70 By virtue of the provision of the cut-out 14, the block 10 has a generally square U-shape in plan. The limbs of the U-shaped block 10 lie one on each side of the recess 14 and their upper portions are cut away so that the top face 22 of each limb lies at a level which is below the level of the top face 24 of the cross bar of the block 10. Each face 22 is joined to the face 24 by a sloping surface 26.

80 Elements 28 forming part of the body of the cushion replace the portions of the block 10 which are cut away, the upper faces 30 of the inserts 28 being at the same level as the top face 24 of the cross-bar of the body.

The rear corners of the cushion are cut away (as shown at 32) to enable the cushion to fit snugly around the uprights found at the rear corners of the seat of the wheel-chair.

The entire upper face of the cushion (excluding, of course, the recess) is covered by a thin layer 34 of soft, foamed synthetic plastics material.

90 The block 10 and integral base 12 can be of a foamed synthetic plastics material having a density of 0,08 g/cm<sup>3</sup> density. The layer 34 and the insert 20 can be of foamed synthetic plastics material having a density of 0,02 g/cm<sup>3</sup> and the elements 28 can have a density of 0,035 g/cm<sup>3</sup>.

If desired, the recess 14 can extend from the rear edge of the cushion to the front edge so that the transverse force 16 is omitted.

100 When a person is seated on the cushion, the ischial tuberosities are supported by the insert 20. The insert 20, being of softer material than the elements 28 and the block 10, gives more readily than the remaining parts of the cushion. The result of this is that the ischial tuberosities support very little of the mass of the user, the patient's mass being transferred to the cushion by way of the buttock regions lying outwardly of the ischial tuberosities and by way of the underside of the thighs. The buttock areas are supported by the elements 28 and the thighs by the cross-bar of the block 10. This reduces the pressure on the ischial tuberosities thereby to minimise the incidence of tissue ischaemia. The elements 28 of medium density foam 115 allow this area of the cushion readily to conform to the user's anatomical shape.

Turning now to Figures 7 and 8, the cushion shown in this Figure comprises three layers 36, 38 and 40 stacked upon one another in such manner as to sandwich the layer 38 between the layers 36 and 40. The layer 38 is cut away to form the recess 14 and the insert 20 fills this recess.

The cushion of Figures 7 and 8 is not intended specifically for use by paraplegics or other wheel-chair patients but on a normal wooden or other hard surfaced chair. The ischial tuberosities bear on the layer 36 at regions which are above the insert 20. It will readily be understood that the layer 36 receives less support from the insert 20 than it does from the layer 38 so that it deforms downwardly more readily

at this region. As with the cushion of Figures 1 to 6, the resultant effect is that little of the user's mass is supported on the ischial tuberosities and more is supported by the buttock regions lying outwardly of the ischial tuberosities and by the thighs which rest on the portions of the layer 36 lying forwardly of the insert 20.

It will be understood that the cushion of Figures 7 and 8 can be used either in the condition illustrated or in an inverted condition with the layer 40 uppermost. The insert 20 must, of course, be adjacent the chair back. If the cushion is turned round so that the insert 20 is at the front then no relief of pressure on the ischial tuberosities will be obtained.

The ischial recess 14, while shown as rectangular, could be modified and might be, for example, a half circle in form.

The cushion of Figure 9 is similar to that of Figures 1 to 6 except in that the front portion of the body 10 is thicker, measured in the vertical direction, than its rear portion. This is achieved by omitting the elements 28. The step 42 thus created in the upper surface of the block 10 has the effect of producing a 'bar' which extends across the width of the cushion. This provides additional support for the thighs of the user.

Figure 10 shows an arrangement in which additional support for the thighs of the person sitting on the cushion is obtained by providing a transversely extending bar 44 of foamed material which is secured to the upper face 24 of the body 10.

The cushion can be of any suitable foamed synthetic plastics material or of foamed rubber. The new types of foamed material which have 'memory' are also suitable and are known variously as temper-foam and visco-elastic foam.

For hygienic purposes all the cushions described can be enclosed in a cover. The cover is itself preferably of two-way stretch material so that this material does not resist to any significant extent deformation of the cushion when a person sits on it.

In a modified form, which has been illustrated by way of example in Figure 9, the side and front faces of the insert 20 are not vertical but slope as shown in chain-dotted lines. The faces 16 of the recess are similarly inclined. When the insert 20 is compressed, the faces of the insert tend to move away from the faces 16. In this form there is no frictional engagement between the faces of the insert and recess which might tend to restrain the insert against compression.

This modification can be applied to all the cushions described.

If the base 12 of the cushion of Figures 1 to 6 is provided with a flat underface, then this cushion can be used with a wheelchair having a flat base, or with an ordinary chair. The cushions of Figures 7 to 10 are, as illustrated, suitable for use on ordinary chairs or with wheel chairs having a flat, rigid base.

However, by the inclusion of a base 12 as shown in Figures 1 to 6, these cushions can also be used with a wheelchair having a depressed base.

## CLAIMS

1. A cushion which comprises a body of foamed synthetic plastics material, the body having a recess in one face thereof to reduce the thickness of the body, over the area of the recess, with respect to the remainder of the body, there being an insert of foamed material in said recess, the material of the insert being less dense and softer than the material of the body, the insert being arranged such that the ischial tuberosities of a person sitting on the cushion bear down on said insert thereby to reduce the portion of the mass of the patient which is supported by the ischial tuberosities.

2. A cushion as claimed in claim 1, wherein the body is of composite form and comprises a main block and two elements, said elements overlying those portions of the main block which are on each lateral side of said recess, said elements being of foamed material which has a density less than the density of the material of the main block and greater than the density of the material of the insert.

3. A cushion as claimed in claim 1 or 2, wherein said remainder of the body has a flat upper face.

4. A cushion as claimed in any preceding claim, wherein the upper face of said remainder of the body is covered by a layer of foamed material which is softer than the material of the body.

5. A cushion as claimed in claim 4, wherein the same material is used for the insert and for said layer.

6. A cushion as claimed in claim 1, and comprising a base layer, an intermediate layer and a top layer forming said body, which is of laminated form, the intermediate layer having a cut-out in an edge thereof and said insert being in said cut-out between said base and top layers.

7. A cushion as claimed in claim 1, wherein said recess is in an edge of said body, said body having portions on each lateral side of said recess and a part joining said portions, the thickness of said portions of the body being less than the thickness of said part of the body, there being a sloping face joining the upper face of each of said portions to the upper face of said part.

8. A cushion substantially as hereinbefore described with reference to Figures 1 to 6, Figures 7 and 8, Figure 9 or Figure 10 of the accompanying drawings.

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